

WHAT IS CLAIMED IS:

1. A structural assembly comprising:
a first pre-cured assembly; and
a 3-D woven textile pre-form that is coupled to said first pre-cured
assembly with a film adhesive, wherein said first pre-cured assemblies, said 3-D
woven textile pre-form, and film adhesive are cured to form the structural
assembly.

2. The structural assembly of Claim 1 further comprising:
at least one additional assembly wherein said at least one additional
assembly is coupled and cured to said first pre-cured assembly and said 3-D
woven textile preform with a film adhesive.

3. The structural assembly of Claim 2, wherein said at least one
additional assembly is a metal assembly or a pre-cured assembly.

4. The structural assembly of Claim 2, wherein said first pre-cured
assembly and said at least one additional assembly are pre-cured laminated
composite structures.

5. The structural assembly of Claim 1, wherein said 3-D woven
textile pre-form is impregnated with an uncured resin.

6. The structural assembly of Claim 2, wherein said first pre-cured
assemblies, said 3-D woven textile pre-form, and film adhesive are cured in an
autoclave with heat and pressure.

7. The structural assembly of Claim 2, where said pressure is applied
with a pressure intensifier located proximate to said pre-cured assemblies and
said 3-D woven textile pre-form.

8. The structural assembly of Claim 2, wherein said pre-assemblies, said 3-D woven textile pre-form, and film adhesive are cured with a low temperature vacuum bag.

5 9. The structural assembly of Claim 2, wherein said pre-assemblies, said 3-D woven textile pre-form, and film adhesive are cured with an E-Beam cure resin system.

10 10. The structure assembly of Claim 2, further comprising composite overwrap plies on the exterior surface of said 3-D woven textile pre-form.

15 11. The structural assembly of Claim 2, wherein said pressure intensifier comprises a flexible material that forces said 3-D woven textile against said first pre-cured assembly and said at least one additional assembly.

12. The structural assembly of Claim 1, wherein said 3-D woven textile further comprises at least one fiber woven through critical intersection zones.

13. A method of forming structural assemblies, comprising the steps of:

affixing a first adhesive film in between a first pre-cured assembly and a 3-D woven textile pre-form;

5 affixing an additional adhesive film between at least one additional pre-cured assembly and said 3-D woven textile; and

curing said adhesive films to form the structural assembly.

14. The method of Claim 13, wherein said 3-D woven textile pre-form is impregnated with an uncured resin.

15. The method of Claim 13, wherein said first pre-cured assembly and said at least one additional pre-cured assembly are pre-cured, laminated composite structures.

16. The method of Claim 14, wherein said step of curing said adhesive films, said 3-D woven textile pre-form, and film adhesive is implemented in an autoclave with heat and pressure.

17. The method of Claim 16, where said pressure is applied with a pressure intensifier located proximate to said pre-cured assemblies and said 3-D woven textile pre-form.

18. The method of Claim 16, wherein said step of curing is implemented within a low temperature vacuum bag.

19. The method of Claim 16, wherein said step of curing is implemented with an E-Beam cure resin system.

20. The method of Claim 16, further comprising the step of applying composite overwrap plies on exterior surfaces of said 3-D woven textile pre-form.

22. The method of Claim 21, wherein said flexible material is rubber.

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24. A method of forming structural assemblies with pre-cured laminated composite structures, comprising the steps of:

affixing a first adhesive film in between a first pre-cured laminated composite structures and a 3-D woven textile pre-form;

5 affixing an additional adhesive film between at least one additional pre-cured laminated composite structures and said 3-D woven textile; and

curing, with heat and/or pressure, said adhesive films, said first pre-cured laminated composite structures, said at least one additional pre-cured laminated composite structures and a 3-D woven textile pre-form to form the structural assemblies.

25. The method of Claim 24, wherein said 3-D woven textile pre-form is impregnated with an uncured resin.

15 26. The method of Claim 25, where said pressure is applied with pressure intensifiers located proximate to said pre-cured laminated composite structures, and said 3-D woven textile pre-form.

20 27. The method of Claim 26, wherein said step of curing is implemented within a low temperature vacuum bag.

28. The method of Claim 26, wherein said step of curing is implemented with an E-Beam cure resin system.

25 29. The method of Claim 26, further comprising the step of applying composite overwrap plies on exterior surfaces of said 3-D woven textile pre-form.

30 30. The method of Claim 26, wherein said pressure intensifier comprises a flexible material that forces said 3-D woven textile pre-form against said first pre-cured laminated composite structures and said at least one additional pre-cured laminated composite structures.

31. The method of Claim 30, wherein said flexible material is rubber.

32. The method of Claim 24, wherein said 3-D woven textile pre-form
further comprises at least one fiber woven through critical intersection zones.

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